November 30 (Stated Meeting.)

SIR WM. R. HAMILTON, LL.D., President, in the Chair.

Mr. Herrick presented to the Academy an ancient wooden vessel, found at a considerable depth in Meenskehy bog, near Mill-street, in the county of Cork. Mr. Herrick observed that some gold ornaments, and a brazen spear head, had been found some years ago in the same locality.

The thanks of the Academy were returned to Mr. Herrick for his donation.

Mr. Ball read a paper "on a Species of Loligo, found on the Shore of Dublin Bay."

After some general observations on the importance and interest attached to the study of cephalopodous Mollusca, the author proceeded to state, that about three years since the subject of his paper was brought to him, with other rejectamenta of the sea, collected after a storm, by his friend, T. W. Warren, Esq. Finding that it was not of a species recorded as British, he endeavoured in vain to trace a description of it in foreign works; he therefore, but not without hesitation, presumed it to be nondescript. Its dimensions are the following:—

Extreme length, to the end of tentacula,	10.0	inches.
Do. of the body or mantle,	3.1	,,
Do. of the head, ...	1.6	,,
Average length of arms, ...	2.8	,,
Length of tentacula, ...	6.0	,,
Breadth of fin, ...	3.0	,,
Length of fin, ...	1.3	,,
Extreme breadth of body, ...	1.7	,,
Length of dorsal lamina, ...	3.5	,,
Extreme breadth of dorsal lamina, . .	0.2	,,

Breadth of largest horny hoops of acetabula, about . . . . . 0.2 inches.

Reference to the Diagrams.

1. Figure of Loligo Eblanæ, half the natural size.

2. Termination of tentacula, with acetabula, natural size.

3. Dorsal lamina, natural size.

4. Beak, natural size.

5. Magnified figure of an acetabulum, or sucker, to show its peduncle.

6, 7. Magnified figures of horny hoops of acetabula.

It was thus shown to be of much shorter proportions than the Loligo vulgaris. Its body is urn-shaped. The large fin, which is somewhat inequilateral, approximates to an ellipse in form, and resembles not a little the fin of Loligo Brongnartii, as figured by Ferussac, to which it also bears likeness, in the structure of its five-ribbed dorsal lamina; but it differs from this animal in its general proportions, and in the horny hoops of its acetabula, which have in each of the

twelve largest in the tentacula about thirty-six sharp and equal teeth. The general form of the whole animal much resembles Onychoteuthis Leachii—a cephalopod of a different genus, with which it may be confounded by a casual observer. Mr. Ball proposed to name the species Loligo Eblanæ.*

In addition to the foregoing, the following species of Loligo have fallen under Mr. Ball's notice, as occurring in the Irish seas :—

Loligo sagittata var. differing in the shortness of its tentacula from the figure given by Ferussac. Several specimens were taken off the coast of Cork by George Allman, Esq.

Loligo vulgaris.

Loligo media.

Loligo media var.—easily distinguished by its greater proportionate length of body, and by the shortness of its tentacula, from the true L. media ; in the form of the fin ternating its mantle, it strongly resembles Loligo subulata. A few specimens, obtained on the coast of Down by the late J. Montgomery, Esq., were submitted to Mr. Ball's inspection by W. Thompson, Esq.†

Mr. Clarke read a paper "on atmospheric Electricity."

The author commenced his paper with a description of the apparatus which he had employed in the experimental investigation of this subject. He showed the inapplicability of the electrometers hitherto employed, and exhibited an

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* The ancient name of Dublin.

† Since the foregoing was written, Mr. Ball was favoured with an inspection of Cuttle-fish bones, found at different times on Magilligan Strand, county of Derry, by Mr. Hyndman, of Belfast. They seem to be those of Sepia rupellaria, figured in Ferussac's third plate of Sepia. His attention was also directed to beaks of Cuttle-fish, found in the stomachs of Delphinus melas and Hyperoodon bidens. They belonged to a species of Cephalopod he has not yet determined. As he purposes writing a monograph of the Cephalopoda of the Irish seas, he requests information on the subject from all who can afford it.

highly insulated galvanometer, containing about three thousand turns of very fine wire covered with silk, varnished and baked,—which instrument, although exquisitely sensitive to the feeblest voltaic electricity, was not at all acted upon by atmospheric electricity of the low tension which exists during serene weather in this country. Mr. Clarke added, that although the application of such an instrument would be a great desideratum in experiments on atmospheric electricity, and in this point of view had been recommended by the highest scientific authorities in Europe, yet he had reason to think that it had never, in any country, been deflected by atmospheric electricity in serene weather.

The author then exhibited the electrometer which he had devised for, and used in his experiments on this subject. It consisted of a bell of glass, seven inches in diameter, through the side of which passed a sliding graduated rod, furnished with a vernier, which indicated the distance, in hundredths of an inch, through which a single pendent slip of leaf gold was attracted towards the rod which was in connexion with the earth. The slip of leaf gold was attached to a vertical and well insulated rod, which passed through a collar of leathers, and could therefore be raised or depressed, as required by the varying intensity, so that the lower end of the leaf should always, when electrified, be a tangent to the ball terminating the graduated rod.

The author then alluded to the received opinion, that the Aurora Borealis is an electric discharge of considerable intensity occurring near the polar regions, at great heights in the atmosphere, where the air is necessarily rare, and where, consequently, the electric light (as shown in our artificial imitation of the phenomenon) must be very much diffused and ramified. Hoping to throw light upon this subject, he had made a series of observations on the electric intensity of the twenty-four hours, commencing at mid-day on the 12th of November, 1838, and continued at intervals of fifteen

minutes,—except during the appearance of the Aurora, when they were made every five minutes, and even oftener. The results of these observations were laid down in a chart, which exhibited the intensity of the electric fluid during these twenty-four hours, a period including that of the magnificent crimson Aurora, which was observed on the night of the 12th, and morning of the 13th of November, 1838, over every portion of the globe. It appeared, by this chart, that the electric intensity during the existence of this magnificent display of Auroral light was but little above the mean electric intensity of that hour during the month; from which the author inferred that this phenomenon, if at all electric, occurred at such a distance as to be unable to affect the apparatus.

The author then proceeded to give an account of the extended series of experiments which he had undertaken at the recommendation of the Academy, and which he had continued during twelve months, at intervals of fifteen minutes, during at least ten days, and from three to seven nights in each month. He stated, that when he had undertaken this series of experiments, he had the following objects in view—namely, to determine the mean amount of electric intensity existing in this country, at the different hours of day and night, and the periods of maxima and minima; and, secondly, to endeavour to trace the cause of this varying intensity to the influence of some of the recognised agents in nature,—such as the variations of atmospheric pressure; the variations of temperature; or the varying quantity of vapour in our atmosphere.

He was happy to announce, that he had not only determined the mean monthly, and annual force of electricity at the several hours of the day and night, but also had succeeded in establishing its dependence upon two, out of the three agents, with which he had originally proposed to investigate its connexion. The two with which he has established its

connexion and proved its dependence are, *temperature*, and the total *quantity of moisture* present in the air, as shown by the dew point. Indeed these two phenomena, as the author remarked, are referrible to each other, the temperature producing evaporation, and the force of electricity at any period being shown to be almost exactly proportional to the tension of the vapour so produced.

The hour of the first electric minimum was shown to be about 3 A. M., the electricity increasing with the temperature until 10 A. M., when a slight decrease occurred; the electric tension again commences rising at about 11 A. M.; and continues to increase until about $2^h\ 45^m$, P. M.—all these movements being in exact proportion to the elevation of the dew point and temperature. At 3 P. M. the dew point and temperature begin gradually to lower, as does also the electricity (but not so quickly); but from 5 to 7 P. M., the electric intensity rises, being acted upon and increased by the precipitation of the evening dew, which has set free the latent electricity of the condensed vapour, in conformity with the experiment of Volta. Again, from 7 P. M., the electric intensity weakens rapidly, and descends in common with the dew point and temperature, until they all reach their minimum about 3 A. M.

Thus the patient investigation of this subject has laid bare the cause of the varying diurnal intensity of the electric fluid,—showing it to be the result of evaporation, which, besides its agency in carrying the electric fluid from our earth to the upper regions of the air, daily returns it to us by the conducting power of this vapour, in the direct proportion of its quantity.

Dr. Smith read a paper "on the Irish Coins of Edward the Fourth," the chief object of which was to endeavour to fix the dates of the numerous coinages of this reign with more precision than had been attained before.

The coins were divided into four sections, each distinguished by its peculiar type,—the Irish, the Anglo-Irish, the English, and the coins with three crowns on the reverse.

In the first section the author pointed out the distinctions not previously recognised, between the groats and the pennies of Henry the Sixth, and those of Edward the Fourth, and showed that some of Edward's coins have been heretofore erroneously appropriated to Henry the Sixth.

In the second section proofs were adduced in corroboration of Mr. Lindsay's opinion concerning the date (1465) of the coins engraved in Snelling's Supplement to Simon, Pl. I. Figs. 18, 19, and also that the coinage of 1467 was erroneously described by Simon as having "a crown on one side," instead of "a face and crown." Two unpublished and unique specimens of this coinage were described,—the double groat of Drogheda, the earliest coin known from this mint, in the cabinet of the Rev. Mr. Butler of Trim; and the half groat of Trim, in the cabinet of the Dean of St. Patrick's. Some remarks were made on the difference between the Tower and the Troy pound, which have been frequently confounded by the writers on Irish coins.

The coins with the King's head on the obverse, and a rose, instead of pellets, in the centre of the reverse, Dr. Smith considers to have been coined in 1470; and he supported his opinion by reference to the Act of the first of Richard the Third, and by other evidence.

In the third section, two unpublished and unique coins were described,—the half groat of Drogheda, in the Dean of St. Patrick's cabinet; and the half groat of Trim, in that of the Rev. Mr. Butler;—and some reasons were assigned to show that the letter G, which is found on most of the groats of Drogheda, Dublin, and Waterford, was the initial of Germyn Lynch, the master of the mint.

In the fourth section Dr. Smith remarked that Sir James Ware, or the writers since his time, had not given any ex-

planation of the meaning of the term "cross-keele groats;" and stated his opinion that it was the Irish word cnoċ caol, (cross-keale, or slender cross,) and that it was applied by the native Irish to distinguish the groats of this period from the other kinds with a broader cross, which were in circulation. There are many instances of coins being denominated from some peculiarity of their type, e. g. Angel, Salute, Harpers, &c.

Many other points of interest to numismatists were fully considered in this communication, and accurate drawings of the coins described were exhibited.

Dr. Apjohn read a note by George J. Knox, Esq., "on the oxidating Power of Glass for Metals, and on the want of Transparency in ancient Glass."

"In a late work, which treats of the manufacture of glass, an experiment of Guyton Morveau is mentioned, in which six per cent. of copper filings having been mixed with pounded glass, and the compound completely melted, it was found to have assumed a red colour uniformly diffused throughout the mass, so deep as to render the glass nearly opaque. The experiment originated from a workman in the glasshouse having dipped a heated copper ladle into a pot of fused glass. The copper ladle was melted; the casting and annealing of the plates were proceeded with as usual; and on their completion the workmen were surprised to find, that not only were grains of metallic copper embedded in the substance of the glass, but bands uniformly coloured of a fine bright red, were distributed throughout the mass.

"The experiment of Guyton Morveau, being but a repetition of the accidental one made by the workman, seems to have but little engaged his attention, the colour being conceived to be due to an *imperfect* state of oxidation, as oxide of copper imparts to glass a greenish colour.

"It appeared to me, at first sight, that the red colour was

due to the actual solution of the copper in the metallic state, the globules of copper imbedded in the mass having been deposited from a state of solution, upon cooling. To determine this, I mixed in different proportions with powdered glass, iron, lead, copper, silver, bismuth, antimony, tin, gold, platinum, in a minute state of division; and found that glass, when mixed with iron filings, will oxidate and dissolve almost as much iron, when mixed with it in the metallic state, as if it were mixed with it in the state of oxide. Of copper, only a small proportion is oxidated and dissolved, imparting a green colour to the glass, while the rest remains disseminated throughout the glass in globules of copper and red streaks, which are probably the protoxide; whereas lead (for whose oxide glass has such a strong affinity) oxidates but a small portion, when mixed with it in the metallic state, the rest being found imbedded in globules throughout its mass. Tin, antimony, and bismuth are more easily oxidized and dissolved than lead. Gold, when fused with glass, imparts to it a light greenish tinge, increasing in depth with the relative proportion of silica in the glass,—producing a deeper colour with the bisilicate than the silicate of potash, and still deeper when German glass (which contains a large proportion of silica) is employed; globules of gold are found (as in the analogous cases of lead and copper) disseminated throughout the mass. If the heat be increased, and the crucible containing the gold be left for some hours in the furnace, the glass assumes a pinkish hue, which is the colour imparted to it by the protoxide of gold. When platinum sponge is fused with glass, it sinks to the bottom of the crucible unaltered, owing to its infusibility. When charcoal is heated with glass, a large proportion is oxidated, the remainder presenting the appearance of a mechanical mixture.

"From these experiments it appears that glass, at high temperatures, not only has the property of oxidating the metals, and forming a chemical compound with the oxide, but

moreover, when the chemical affinity is satisfied, of dissolving the oxides, and probably the metals themselves when in a state of fusion; the latter, on the cooling of the glass, being deposited in globules throughout its interstices, (at least the appearance presented by the glass seems to favour such an opinion.)

"The colours produced by the fusion of metals with glass, being different in many cases from those obtained when their oxides were employed, and presenting the dull untransparent appearance which is so remarkable in ancient glass, led me to suppose that the ancients did not employ any colouring matter unknown at the present day, but that, being unacquainted with the mineral acids, they employed the metals either in the metallic state, in filings, or else in an imperfect state of oxidation. To determine the probability of this conjecture, I selected three specimens of mosaic glass, analyzed by Klaproth; and substituting for the oxides, in the same relative proportion, the metals in a minute state of division, I obtained coloured glasses of nearly the same colour as the mosaics, while the colours produced when the oxides were employed were not only perfectly different, but the glasses were clear and transparent.

"One of a lively copper red, opaque and very bright, contained, in 200 grains, silica 142, oxide lead 28, copper 15, iron 2, alumina 5, lime 3.

"Another, of a light verdigris green, contained, in 200 grains, silica 130, oxide copper 20, lead 15, iron 7, lime 13, alumina 11.

"A specimen of blue glass contained, in 200 grains, silica 163, oxide iron 19, oxide copper 1, alumina 3, lime $\frac{1}{2}$."

The Secretary read a note by George J. Knox, Esq., "on a gaseous Compound of Fluorine and Cyanogen."

When recently ignited fluoride of silver is mixed with several times its weight of dry solid cyanogen, and heated

in a platinum crucible, which fits to one extremity of a platinum tube, to the other extremity of which is adapted a small platinum receiver, (the junction between the latter being rendered air-tight with caoutchouc, and the receiver and tube being immersed in a freezing mixture of ice and snow,) no solid or liquid product is obtained in the tube or receiver; the fluoride of silver is converted into cyanuret of silver; and a gas is evolved, which has a stronger effect upon the eyes and throat than hydrofluoric acid, producing sickness, headache, and vertigo. This gas acts strongly upon glass, reddens litmus, and burns in the flame of a spirit lamp with a yellowish light. It remains for a considerable time in the platinum vessel, showing that its specific gravity is greater than that of atmospheric air.

The same gas is obtained, when a current of gaseous cyanogen is passed over fluoride of silver fused in the platinum tube.